

WHAT IS CLAIMED IS:

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- sub A2
- sub B2
1. A battery pack comprising:
a case containing a plurality of cells,
at least one air passage formed within the case for allowing cooling air outside the case to enter the case, pass along and/or between the cells, and exit from the case, and
at least one radiator provided in the at least one air passage so as to be in contact with outer surfaces of the cells, wherein the heat capacity of the at least one radiator increases in the downstream direction of a flow of the cooling air.
 2. A battery pack in accordance with claim 1, wherein said increase in the heat capacity is achieved by increasing at least one of the surface area and the volume of the at least one radiator.
 3. A battery pack in accordance with claim 1, wherein each radiator has a cross-section, transverse to the direction of the flow of the cooling air, that progressively increases in size along said direction of the flow.
 4. A battery pack in accordance with either claim 1 or 2, wherein each radiator is contoured to conform to the outer surfaces of the cells.
 5. A battery pack in accordance with claim 1, wherein each radiator is a generally rectangular plate having an inner surface contoured to conform to the outer surfaces of the cells and an outer surface opposite the inner surface, the outer surface of each plate having a plurality of radiator fins thereon protruding into the respective air passage.
 6. A battery pack in accordance with claim 5, wherein the radiator fins includes a plurality of horizontal fins with different lengths, the fins being arranged in parallel both with respect to any of the other fins and to the direction of the cooling airflow such that the heat capacity of each radiator increases in the downstream direction of the cooling air.
 7. A battery pack in accordance with claim 5 or 6, wherein the number of fins of each radiator plate increases in the downstream direction of the cooling airflow.
 8. A battery pack comprising:
a case containing a plurality of cells,
- sub A3

at least one air passage formed within the case for allowing cooling air outside the case to enter the case, pass along and/or between the cells, and exit from the case, and

radiator means provided in the at least one air passage so as to be in contact with outer surfaces of the cells, the radiator means having portions each of which corresponds to at least one of the cells, wherein the portions have different heat capacities according to the heat conditions of the corresponding cells.

9. A battery pack in accordance with claim 8, wherein the heat capacity of each portion of the radiator means is determined by the area of contact of the portion with the corresponding cell.

10. A battery pack in accordance with claim 8, wherein the heat capacity of each portion of the radiator means is determined by the thickness of the portion.

11. A battery pack in accordance with claim 8, wherein the heat capacity of each portion of the radiator means is determined by the material of the portion.

12. A battery pack in accordance with claim 8, wherein the heat capacity of each portion of the radiator means is determined by any combination of the area of contact of the portion with the corresponding cell, the thickness of the portion, and the material of the portion.

13. A battery pack in accordance with claim 8, wherein the cells are divided into at least one first cell group and at least one second cell group, each cell group including at least one cell and having different heat conditions, and the radiator means includes a plurality of radiator plates having different heat capacities, each radiator plate being in contact with one of the first and second cell groups.

14. A battery pack in accordance with claim 13, wherein the battery pack comprises one first cell group located generally in the center thereof and two second cell groups interposing the first cell group across branches of the at least one air passage.

15. A battery pack in accordance with claim 14, wherein the radiator plates include a first radiator plate and two second radiator plates, the first radiator plate surrounding the first cell group around its entire periphery and each of the second radiator plates abutting inner surfaces of one of the second cell groups, and wherein the first radiator plate has a smaller heat capacity than each of the second radiator plates.

16. A battery pack in accordance with claim 15, wherein the first radiator plate is made of a synthetic resin and each second radiator plate is made of at least one metal selected from a group consisting of aluminum, copper, and iron.

17. A battery pack in accordance with claim 15, wherein the portions of the second radiator plate become thicker in a stepwise manner along the downstream direction of a flow of the cooling air.

18. A battery pack in accordance with claim 15, wherein the first radiator plate and the second radiator plates have a plurality of portions corresponding to different cells and adapted to remove heat from the corresponding cells, said portions having different heat capacities according to the heat conditions of the corresponding cells.

19. A battery pack in accordance with claim 18, wherein the heat capacity of each portion of each second radiator plate is determined by the area of contact of the portion with the corresponding cell.

20. A battery pack in accordance with claim 18, wherein the heat capacity of each portion of the first and second radiator plates is determined by the thickness of the portion.

21. A battery pack in accordance with claim 15, wherein the heat capacity of each portion of each second radiator plate is determined by any combination of the area of contact of the portion with the corresponding cell and the thickness of the portion.

22. A battery pack in accordance with claim 14, wherein the second cell groups are symmetrical and include an equal number of cells and the first cell group includes fewer cells than each of the second cell groups.

23. A battery pack in accordance with claim 14, wherein each second cell group has inner surfaces in contact with one of the second radiator plates, and each second cell group is arranged in a single row of cells bent at one intermediate cell toward the inner surface, the portion of each second radiator plate corresponding to the intermediate cell including two bulges adjacent to and interposing the intermediate cell.

24. A battery pack in accordance with claim 23, wherein each bulge is thicker than the remainder of the second radiator plate.